In the Claims:

J. P.

Claims 1-192 (Canceled).

- 193. (New) A method of generating cells capable of secreting insulin, the method comprising:
 - (a) subjecting mammalian embryonic stem cells to a first set of culturing conditions selected suitable for differentiation of at least a portion of said mammalian embryonic stem cells into cells displaying at least one characteristic associated with a pancreatic islet cell progenitor phenotype; and
 - (b) subjecting said cells displaying at least one characteristic associated with a pancreatic islet cell progenitor phenotype to a second set of culturing conditions selected suitable for formation of surface bound cell clusters including insulin producing cells, thereby generating cells capable of secreting insulin.
 - 194. (New) A method of producing insulin, the method comprising:
 - (a) subjecting mammalian embryonic stem cells to a first set of culturing conditions selected suitable for differentiation of at least a portion of said mammalian embryonic stem cells into cells displaying at least one characteristic associated with a pancreatic islet cell progenitor phenotype; and
 - (b) subjecting said cells displaying at least one characteristic associated with a pancreatic islet cell progenitor phenotype to a second set of culturing conditions selected suitable for formation of surface bound cell clusters including insulin producing cells, thereby producing the insulin.
 - 195. (New) The method of claim 193, further comprising:
 - (c) isolating said surface bound cell clusters and optionally isolating said insulin producing cells therefrom.

- 196. (New) The method of claim 193, further comprising:
- (c) dissociating said surface bound cell clusters into single cells including said insulin producing cells; and
- (d) subjecting said single cells to a third set of culturing conditions selected suitable for maintaining said insulin producing cells in culture for at least 14 days.
- 197. (New) The method of claim 196, further comprising:
- (e) isolating said insulin producing cells.
- 198. (New) The method of claim 196, wherein said third set of culturing conditions is selected suitable for maintaining said insulin producing cells in suspended cell clusters.
- 199. (New) The method of claim 198, wherein said suspended cell clusters are characterized by a proportion of said insulin producing cells of at least 4 percent.
- 200. (New) The method of claim 198, wherein an insulin secretion rate capacity of said insulin producing cells of said suspended cell clusters is at least 6 microunits insulin per one hundred thousand cells per hour.
 - 201. (New) The method of claim 194, further comprising:
 - (c) harvesting the insulin..
 - 202. (New) The method of claim 198, further comprising:
 - (e) isolating said suspended cell clusters.
- 203. (New) The method of claim 196, wherein said third set of culturing conditions is selected suitable for inhibiting growth of substantially non insulin producing cells.
- 204. (New) The method of claim 203, wherein said substantially non insulin producing cells are neurons and/or mesenchymal cells.

- 205. (New) The method of claim 196, wherein said dissociating said surface bound cell clusters into single cells is effected by trypsinization of said surface bound cell clusters.
- 206. (New) The method of claim 196, wherein said third set of culturing conditions includes a condition selected from the group consisting of a substantially serum free culture medium, a basic fibroblast growth factor free culture medium, a culture medium including nicotinamide, a culture medium including a synthetic serum supplement, a culture medium including glucose at a concentration of 15 millimolar or less, and inhibiting adherence of said insulin producing cells to a surface.
- 207. (New) The method of claim 193, wherein said first set of culturing conditions is selected suitable for inducing formation of embryoid bodies.
- 208. (New) The method of claim 193, wherein said first set of culturing conditions is selected capable of inhibiting adherence of said mammalian embryonic stem cells to a surface.
- 209. (New) The method of claim 193, wherein said at least one characteristic associated with a pancreatic islet cell progenitor phenotype is expression and optionally display of nestin.
 - 210. (New) The method of claim 193, further comprising:
 - (c) dissociating said cells displaying at least one characteristic associated with a pancreatic islet phenotype into single cells displaying at least one characteristic associated with a pancreatic islet phenotype; and
 - (d) subjecting said single cells displaying at least one characteristic associated with a pancreatic islet cell progenitor phenotype to a fifth set of culturing conditions selected suitable for proliferation of said cells displaying at least one characteristic associated with a pancreatic islet cell progenitor phenotype prior to step (b).
- 211. (New) The method of claim 210, wherein said fourth set of culturing conditions includes a culturing condition selected from the group consisting of a

substantially serum free culture medium, a culture medium including insulin, a culture medium including transferrin, a culture medium including fibronectin, a culture medium substantially including selenium, and facilitating adherence of said cells displaying at least one characteristic associated with a pancreatic islet cell progenitor phenotype to a surface.

- 212. (New) The method of claim 193, wherein said second set of culturing conditions is selected suitable for formation of cell clusters including cells displaying at least one characteristic associated with a pancreatic islet cell phenotype selected from the group consisting of an endocrine cell precursor phenotype, an alpha cell phenotype, a beta cell phenotype, a delta cell phenotype, and a neuronal cell phenotype.
- 213. (New) The method of claim 193, wherein said second set of culturing conditions is selected suitable for formation of cell clusters including insulin producing cells capable of displaying a change in an insulin secretion in response to a drug selected from the group consisting of an increase in said insulin secretion wherein said drug is tolbutamide, an increase in said insulin secretion wherein said drug is lBMX, a decrease in said insulin secretion wherein said drug is diazoxide, a decrease in said insulin secretion wherein said drug is nifedipine, and a decrease in said insulin secretion wherein said drug is carbachol.
- 214. (New) The method of claim 193, wherein said mammalian embryonic stem cells are human embryonic stem cells.
- 215. (New) The method of claim 214, wherein said human embryonic stem cells are selected from the group consisting of I6 cells, H9 cell derived cells, and H13 cells.
- 216. (New) The method of claim 215, wherein said H9 cell derived cells are H9.2 cells.

- 217. (New) An insulin producing cell cluster comprising insulin producing cells being maintainable in culture for at least 14 days, wherein a proportion of said insulin producing cells in the cell cluster is at least 4 percent.
- 218. (New) The insulin producing cell cluster of claim 217, wherein said proportion of said insulin producing cells in the cell cluster is at least 32 percent.
- 219. (New) The insulin producing cell cluster of claim 217, wherein an insulin secretion rate capacity of said insulin producing cells is at least 6 microunits insulin per one hundred thousand cells per hour.
- 220. (New) The insulin producing cell cluster of claim 217, wherein the cell cluster further comprises cells displaying at least one characteristic associated with a pancreatic islet cell phenotype selected from the group consisting of an endocrine cell precursor phenotype, an alpha cell phenotype, a beta cell phenotype, a delta cell phenotype, and a neuronal cell phenotype
- 221. (New) The insulin producing cell cluster of claim 217, wherein said insulin producing cell cluster produces human insulin.
- 222. (New) The insulin producing cell cluster of claim 217, wherein said insulin producing cell cluster includes human cells.
- 223. (New) The insulin producing cell cluster of claim 222, wherein said human cells have a genotype of I6 cells, H9 cell derived cells, and H13 cells.
- 224. (New) The insulin producing cell cluster of claim 223, wherein said H9 cell derived cells are H9.2 cells.
- 225. (New) A method of treating a pancreatic disease in a subject, the method comprising:
 - (a) subjecting mammalian embryonic stem cells to a first set of culturing conditions selected suitable for differentiation of at least a portion of said mammalian embryonic stem cells into cells displaying at least one

- characteristic associated with a pancreatic islet cell progenitor phenotype;
- (b) subjecting said cells displaying at least one characteristic associated with a pancreatic islet cell progenitor phenotype to a second set of culturing conditions selected suitable for formation of surface bound cell clusters including insulin producing cells; and
- (c) administering a therapeutically effective dose of said insulin producing cells to the subject, thereby treating the pancreatic disease.
- 226. (New) The method of claim 225, further comprising isolating said surface bound cell clusters and optionally said insulin producing cells therefrom prior to step (c).
 - 227. (New) The method of claim 225, further comprising:
 - (d) dissociating said surface bound cell clusters into single cells including said insulin producing cells; and
 - (e) subjecting said single cells to a third set of culturing conditions selected suitable for maintaining said insulin producing cells in culture for at least 14 days prior to step (c).
- 228. (New) The method of claim 225, wherein a total insulin secretion capacity of said insulin producing cells of said suspended cell clusters is at least 0.50 microunits insulin per one hundred thousand cells.
- 229. (New) The method of claim 225, wherein said mammalian embryonic stem cells are human embryonic stem cells.
- 230. (New) The method of claim 229, wherein said human embryonic stem cells are selected from the group consisting of I6 cells, H9 cell derived cells, and H13 cells.
- 231. (New) The method of claim 230, wherein said H9 cell derived cells are H9.2 cells.

- 232. (New) The method of claim 225, wherein said insulin producing cells are syngeneic with or allogeneic with the subject.
- 233. (New) The method of claim 225, wherein the subject is a human or a non human mammal.
- 234. (New) The method of claim 225, wherein said administering is effected by transplantation or injection of said insulin producing cells into the pancreas of the subject.